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A Comparison of Infant and Toddler Reactions to Strangers who Have Similar Attributes to an Established Attachment Figure vs. Strangers who Have Different Attributes

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A Comparison of Infant and Toddler Reactions to Strangers who Have Similar Attributes to an Established Attachment Figure vs. Strangers who Have Different Attributes

A Comparison of Infant and Toddler Reactions to Strangers who Have Similar Attributes to an
Established Attachment Figure vs. Strangers who Have Different Attributes

A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Science in Human Environmental Sciences

by

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Bachelor of Science in Human Environmental Sciences, 2012

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Abstract

A child's early attachment experiences can have a lasting impact on later development. Early attachment relationships often result in greater social and cognitive skills, as well as better school performance (Peisner et al., 1999). For these reasons, it is important to address those components that may contribute to secure attachments with care givers in the child care setting. The current study looked at the reactions of infants and toddlers when presented with two previously unknown individuals: one who physically resembled an established caregiver with whom they had already established attachment and one who looked different from this caregiver. The study utilized a mixed method design that included parent and teacher questionnaires, as well as video recordings of the interactions between children and two new individuals. The process used for the video recordings was an adapted version of the Strange Situation developed by Mary Ainsworth and colleagues (Ainsworth & Bell, 1970). The 13 infants and toddlers who participated in the study experienced 5 sessions, which included their teacher, a session with an adult who looked similar to the teacher, and a session with a dissimilar looking adult. Findings indicated that children did display more acceptance behaviors with individuals who looked similar to a current caregiver. Data on video recording was broken into 3 categories: affect, child bids, and child response to adult bids. Paired t-tests determined that all session comparisons except for Sessions 2 and 4 for affect, and Sessions 2 and 4 for child response were statistically significant ($P=.05$). Cohen's Kappa was used to determine parent and teacher agreement for indicators of attachment. A moderate agreement was found for the cling/smile category (.57), and a fair agreement was found for the remaining three categories: crying (.22), following (.28), and reaching (.32).

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I: Introduction

Infants and toddlers typically become attached to one or more caregivers while they are young. This connection begins to develop at birth (Bowlby, 1969). Attachment develops over time when adults respond sensitively and consistently to a child's needs (Hirsh-Pasek & Golinkoff, 2003). Parents are typically the primary attachment figures, but children also typically develop attachments to secondary caregivers as well (Bowlby, 1969). Secondary caregivers, such as child care workers, often spend a large amount of time with these children on a daily basis. Millions of young children spend time in child care from a very early age each year, and some of these children spend 40 hours or more per week at a child care facility (Belsky et al., 2007).

The effect of child care on children has been debated for years. It has often been thought that center care is harmful to children, and that maternal care is the best option for children (Hirsh-Pasek & Golinkoff, 2003; Belsky et al., 2007). However, other research refutes such findings. Using a large national data set, The National Institute of Child Health and Human Development (NICHD) analyzed data conducted on more than 1,000 children from 1 month to 3 years of age during the span of 1991-1994 (NICHD, 2006). They found that children exclusively cared for by their mothers did not develop differently than children who were also cared for by others (NICHD, 2006).

However, the quality of care a child receives most likely plays an important role later development (Peisner et al., 1999). Quality child care can be defined in many ways. The NICHD study (2006) based quality child care on factors that were regulated by outside agencies, such as child-adult ratios, and the experiences children had while in care which included social interaction. Another definition considered quality child care as responsive adults who implement

developmentally appropriate practices (DeBord, n.d.). High quality care can be very beneficial for young children because it provides children with a stimulating environment that also meets their needs. Young children have an opportunity to develop cognitive as well as social skills in a quality environment, which has an effect on the type of attachment children develop for their caregivers (Raikes, 1993). Quality care not only has an effect on development in infancy, but it is also related to outcomes later in life.

Research indicates that children who develop close relationships to caregivers in the early years achieve greater social and cognitive skills, and have higher math and language abilities from preschool into elementary school (Peisner et al, 1999). Thus, quality of care is an imperative aspect of infant attachment. Infants need to have their needs met consistently in order to develop a secure attachment to a caregiver (Hirsh-Pasek & Golinkoff, 2003). When there is just one caregiver to care for up to 6 children, as has been allowed in the state of Arkansas prior to 2015, attachment is less likely to occur. Caregivers who must split their time between many children will likely be unable to consistently respond to each child's needs, which could result in less secure attachments. States have their own minimum requirements when it comes to ratios. However, the minimum requirement is typically not satisfactory. In Arkansas, this minimum ratio, which is determined by the Arkansas Department of Human Services Division of Child Care and Early Childhood Education, changed to 1:5 beginning in January 2015. However, this minimum requirement does not meet the standard for quality care. According to the National Association for the Education of Young Children (NAEYC), the preferred ratio is 1:4, and the American Academy of Pediatrics recommends a ratio of 1:3 for children from birth-to-18 months of age (NAEYC, 2013; APA, 2013). Studies have shown that exposure to low quality care and

high staff to child ratios often results in insecure infant attachment (Belsky, 2009). However, it is expensive to maintain this ratio, which is one of the main reasons it is fairly uncommon in child care centers. According to Helburn and Howes (1996), parent fees are the largest source of revenue for child care centers, while personnel costs are the largest expenditure. When child care centers operate with lower ratios, they are less likely to make a profit, which is why high quality centers are hard to find, as well as the main reason they tend to be expensive.

Purpose of Study

The current study will compare infants' and toddlers' reactions to two unfamiliar persons, one who has physical attributes similar to those of an already established attachment figure and one whose attributes are unlike those of the attachment figure. Because children's secure attachments to caregivers are likely to facilitate a positive experience in childcare, it is important to examine this construct of a quality experience. The collected data may provide information to inform best practices for placement of infants and toddlers with primary caregivers in child care settings. If an infant or toddler is placed with a teacher who best matches the attributes of an established attachment figure, it might facilitate a smoother attachment process.

Statement of the Problem

Due to the significant outcomes associated with early child-caregiver attachments, more importance should be placed on improving the quality of these experiences. Perhaps secure attachments could be fostered by placing children with caregivers who have familiar characteristics to their mothers rather than dissimilar caregivers. . Thus, child care facilities could make an effort to ease a child's transition to a new environment by exposing them to individuals

who have familiar attributes to those to whom they are already attached, as well as making an effort to provide ample teacher training and lower turnover rates.

Objectives

1. Describe the aspects of infant attachment and reception of new faces.
2. Determine the relationship between familiar characteristics and acceptance behaviors of infants and toddlers.

Research Questions

1. Will infants and toddlers display acceptance behaviors toward individuals who look similar to caregivers to whom they are attached compared to those who do not look similar?
2. Do parents and teachers have similar perceptions of children's attachment behaviors?

Limitations

The participants are limited to one child care facility. Therefore, the results cannot be generalized beyond the population of this study.

The temperament and/or mood of a participant at the time of the study could influence their response.

The recordings of each session will be limited to two cameras. This could affect the quality of footage that would be useful in coding.

Definition of Terms

Acceptance behaviors: Positive or neutral behaviors children display toward others.

Attachment: the strong emotional bonds one person develops for another (Bowlby, 1979). For this study, attachment will primarily relate to the relationship between infants and secondary caregivers.

Attachment Behaviors: behaviors that develop based on the style of attachment one person develops for another (Bowlby, 1969). Includes proximity, smiling, crying, etc.

Attachment style: a description of the type of attachment one person has for another (Ainsworth, 1973). This includes: secure, avoidant, and resistant.

Caregiver: Any person who provides care for another person (Bowlby, 1969). Specifically, a parent or child care worker.

Facial Recognition: Familiarity with the facial features of another person (Nelson, 2001). For this study, it will refer to the child being familiar with the caregiver's facial features.

Infant: a child between birth and one year of age (Ainsworth, 1978).

Phenomenology: the study of the phenomena that occurs within human consciousness.

Toddler: a child between 12 months and 3 years of age.

II: Literature Review

Theoretical Perspectives

Attachment theory has been studied for decades (Lorenz, 1935; Harlow & Zimmerman, 1958; Bowlby, 1969; Ainsworth & Bell, 1970; Cassidy & Shaver, 2008). However, the two most notable contributors to this theory are John Bowlby, considered the father of attachment theory, and Mary Ainsworth (Hirsh-Pasek & Golinkoff, 2003). These researchers desired to explain a child's response during a separation from the mother (Bowlby, 1969). Attachment Theory began primarily as a psychoanalytic concept, but Bowlby also incorporated elements of ethology (Bowlby, 1969).

Attachment theory refers to the strong emotional bonds one person develops for another, as well as the distress that separation from that person causes (Bowlby, 1979). According to

Bowlby, “many of the most intense human emotions arise during the formation, maintenance, disruption, and renewal of attachment relationships” (1979, p. 130). The development of these bonds results in the occurrence of any one of several attachment behaviors, including any type of behavior that results in one person attaining and maintaining proximity to another preferred individual. Thus, proximity is an essential aspect of an affectionate bond. Another type of attachment behavior Bowlby identified is crying and calling out, which elicits attention from the caregiver. A final type of attachment behavior includes following, clinging, and protesting when left with a stranger.

Bowlby (1969) postulated that these behaviors can also be separated into two specific categories: signaling behavior and approach behavior. The purpose of signaling behavior is to bring the mother to the child. Signaling behaviors include crying, smiling, babbling, as well as calling and other gestures when a child is older. The gesture of raised arms which typically does not occur until six months or later is another type of signaling behavior. This is normally interpreted as a desire to be picked up, and the anticipated response typically occurs. Bowlby found crying is often the most effective form of signaling behavior as it is more likely to result in increased proximity to the mother. Initially, these signaling behaviors are not goal-corrected; they are not dependant on the responses displayed by caregivers. Rather, children emit these signals, and they are either responded to or they are not, depending upon the caregiver’s action or lack thereof.

Bowlby’s second category of attachment behaviors is known as approach behavior (1969). The purpose of approach behavior is to bring the child to the mother. The specific behaviors associated with approach include seeking, following, and clinging. These behaviors

typically manifest as soon as a child is mobile and include crawling, shuffling, walking, running, and even rolling. Unlike signaling behaviors, approach behaviors are initially goal-corrected. Moreover, these goal-corrected behaviors indicate the child has a plan: the objective of proximity is constant, while the techniques used to accomplish this are flexible.

Research indicates that attachment does not develop as the result of needs or drives (Bowlby, 1969). Instead, it appears that attachment behaviors manifest when behavioral systems are triggered. Infants are born with behavioral systems that are ready to be activated, but they rely on certain stimuli to either initiate or terminate them. The systems that include crying, sucking, and clinging are primitive. Bowlby also believed these behavioral systems develop in response to the child's "environment of evolutionary adaptedness, and especially of his interaction with the principal figure in that environment" (1969, p. 180).

According to Bowlby, attachment development is divided into four phases (1969). In the first phase, entitled Orientation and Signals without Discrimination of Figure, infants behave in characteristic ways toward most people as the ability to distinguish one person from another is most likely nonexistent or very limited. This phase occurs from birth to between 8 and 12 weeks in most cases, but can last much longer in undesirable situations. Babies in this phase demonstrate certain behaviors toward people around them: tracking their eye movements, grasping, reaching, smiling, and babbling. These infants also tend to stop crying when they hear a voice or see a face. These behaviors typically influence the behavior of the person the baby has come into contact with, and the behavior is likely to affect the amount of time the infant is in proximity to that person. The intensity of these responses will often increase after about 12 weeks.

The second phase of attachment (Bowlby, 1969) is Orientation and Signals Directed Towards One (or More) Discriminated Figure(s). An infant in this phase behaves similarly with other people as in Phase 1, but in a more obvious way with the mother figure. Babies are unlikely to display discriminate responses to auditory stimuli before around 4 weeks of age, and about 10 weeks of age for visual stimuli. However, both of these responses are apparent in children age 12 weeks and beyond who are raised in a family setting. This phase usually lasts until about 6 months of age, but can last much later in some circumstances.

Maintenance of Proximity to a Discriminated Figure by means of Locomotion as well as Signals is the third phase of attachment (Bowlby, 1969). This phase normally begins between 6 and 7 months of age, but could be delayed past a child's first birthday and most likely lasts into the third year of age. Infants in this phase are becoming increasingly discriminate with their behavior toward other people. They no longer behave in friendly ways with most people. Instead, they select certain people to serve as secondary attachment figures. In this phase, infants regard strangers with caution, and eventually become alarmed and withdraw from strangers. Infants also develop other responses during this phase: following a departing mother, greeting the mother when she returns, and using the mother as a secure base from which to explore. These behaviors become goal-corrected during this phase due to the organization of some of the systems that are responsible for the behaviors. This results in a very obvious attachment to the mother.

Bowlby's (1969) final phase of attachment is Formation of a Goal-corrected Partnership, which is unlikely to begin before a child is two years of age, and for many children this does not occur until around their third birthday. Children in this phase begin maintaining proximity to attachment figures through the use of goal-corrected systems based on a relatively

unsophisticated cognitive map. Based on this map, the mother-figure is eventually regarded as a persistent, independent object that moves in relatively predictive ways. Despite this understanding, young children are unlikely to understand what influences the mother's behavior and what the child can do, if anything, that will change her behavior. The concept that the mother has her own goals which affect her actions is likely beyond the child's competence from birth to 3 years. However, this eventually changes. Sooner or later, a child is able to determine some of the mother's goals and the actions she uses to accomplish them through observation. Once a child has accomplished this, their view of the world becomes more sophisticated and it is possible that their behavior will become more flexible (Bowlby, 1969).

According to Bowlby (1969), a child's primary attachment figure is typically the child's biological mother, but other mother-figures can fill this role. However, Bowlby postulated that a substitute mother-figure is usually at a disadvantage compared to the biological mother, because the substitute will not experience the same hormone levels, which could potentially result in less strong and less consistent mothering responses. Also, these secondary attachments are not equal, as children typically develop a hierarchy of caregivers. Nevertheless, when a substitute mother does behave in an appropriate mothering way, the child will treat them in the same manner as another child would treat their natural mother. This mothering behavior refers to participating in lively interaction with the child, as well as responding to the child's signals and approaches (1969). Children seek out at least one attachment figure when they are tired, hungry, ill, or anxious. Furthermore, attachment behavior is not always a sign of an attachment bond, as children do occasionally direct this behavior towards those to whom they are not attached (Ainsworth et al., 1978). During times of distress, some children stop crying when a stranger

offers comfort, but this component of attachment behavior is not a sign of attachment to the stranger (Ainsworth et al., 1978; Bowlby, 1969).

Bowlby (1969) stated that a baby develops attachment to the primary attachment figure, as well as a secondary attachment to a number of others in hierarchy form, depending on who cares for them. According to Colin (1996), several factors exist that contribute to this attachment hierarchy: “1) how much time the infant spends in each figure’s care; 2) the quality of care each provides, 3) each adult’s emotional investment in the child, and 4) social cues” (p. 194).

Furthermore, infants have an innate bias to orient toward stimuli produced by those who care for them. The exposure infants have to caregivers results in the ability to differentiate them from other people (Bowlby, 1969). Infants have another innate bias to approach the familiar. This bias results in babies using their motor abilities to approach familiar figures that they have learned to discriminate from others. These behaviors are then augmented as infants receive feedback from attachment figures (Bowlby, 1969). Babies will develop a secure attachment to caregivers who consistently and sensitively respond to their needs (Hirsh-Pasek, Golinkoff & Eyer, 2003).

According to Bowlby, some children experience delays in developing attachment (1969). While most children display obvious signs of differentiated attachment behavior by 9 months of age, Bowlby observed that in some situations, it is delayed until into a child’s second year of life. One possible explanation for this is due to a child experiencing inadequate social interaction from the primary attachment figure. Specifically, these children experience an insufficient combination of visual, auditory, tactile, kinesthetic, and olfactory stimulation (Bowlby, 1969).

Mary Ainsworth, originally Bowlby’s graduate student, was another very important contributor to Attachment Theory. Her most notable contribution was her Strange Situation

experiment and the information it provided. This experiment originally consisted of 106 infants who were approximately one year of age (Ainsworth, Blehar, Waters, & Wall, 1978). The participants of this study were exposed to the same eight episodes during the course of the experiment (Ainsworth et al., 1978). One important finding that came from the strange situation experiments was that not only does attachment persist as attachment behaviors vary, but that children appear to be predisposed to maintain proximity to an attachment figure (Ainsworth et al., 1978). It has also been determined that attachment behaviors increase during situations that are interpreted as threatening or dangerous (Ainsworth & Bell, 1970; Bowlby, 1979). Another finding from the strange situation determined that children are incapable of exploratory behavior when attachment behavior has been strongly activated (Ainsworth & Bell, 1970). However, when a child does not experience any threat of separation from the mother, they use her as a secure base from which to explore (Ainsworth & Bell, 1970).

Ainsworth is also known for identifying styles of attachment. Her research and observation determined that many children exhibit one, or a combination, of three styles of attachment. These styles are secure, avoidant/insecure, and ambivalent/resistant (Ainsworth, 1967). Secure attachments refer to children who regularly seek proximity to their caregiver and protest when a separation from the caregiver occurs. When the caregiver returns, they allow the caregiver to comfort them before returning to their explorations. Children with avoidant/insecure attachments display little to no distress to being separated from the caregiver, as well as little to no response to the caregiver returning. These children often ignore or turn away from the caregiver when they make an attempt to comfort the child. Children who have developed ambivalent/resistant attachment show distress before and during a separation from the caregiver.

When the caregiver returns, these children often display ambivalence or anger towards the caregiver.

Child Care

While it was uncertain at first whether or not children could develop multiple attachments, Bowlby determined that it is possible (1979). One very common place children develop secondary attachments is child care facilities. In the spring of 2011, roughly 12.5 million, or 60%, of children under 5 years of age spent time in some form of regular child care (Laughlin, 2013). Specifically, almost 33% of these children were enrolled in nonrelative care (Laughlin, 2013). According to the United State Census Bureau, 7 million children are enrolled in center-based care (2010).

The quality of care that children in child care centers receive varies greatly. The NICHD study determined quality of care based on both “regulable” and process features (2006). Regulable features of child care included adult-to child ratio, group size, and the education level of the caregivers (NICHD, 2006). Process features are the interactions children have with teachers, peers, and the activities involving toys and other objects (NICHD, 2006). The NICHD also considered accreditation by professional organizations, such as NAEYC, to be a feature of quality child care (2006). Professional organizations set higher standards than the minimum requirements determined by state agencies. As previously mentioned, infants need to have their needs met consistently in order to develop a secure attachment to a caregiver (Hirsh-Pasek & Golinkoff, 2003). When there is just one caregiver to care for up to six children, as has been allowed in the state of Arkansas until 2015, attachment is less likely to occur. States have their own minimum requirements when it comes to ratios. However, the minimum requirement is

typically not satisfactory. In Arkansas, this minimum ratio, which is determined by the Arkansas Department of Human Services Division of Child Care and Early Childhood Education, is not 1:5, which began in January 2015. However, even this lowering of the ratio does not meet the standard for quality care. According to the National Association for the Education of Young Children (NAEYC), the preferred ratio is 1:4, and the American Academy of Pediatrics recommends a ratio of 1:3 for children from birth to eighteen months of age (NAEYC, 2013; APA, 2013). Studies have shown that exposure to low quality care and high staff to child ratios often result in insecure infant attachment (Belsky, 2009). However, it is expensive to maintain this ratio, which is one of the main reasons it is fairly uncommon in child care centers.

Another aspect of child care that can have an effect on children's development is the high turnover rate. According to the NAEYC, the average annual turnover rate in child care is 30% (2013). This extremely high rate can have many negative effects on children. When an attachment figure leaves, a child can develop emotional stress (Hale-Jinks, Knopf, & Knopf, 2006). This kind of stress early in life can have an effect on multiple aspects of a child's development, especially when it occurs multiple times (Hale-Jinks, Knopf, & Knopf, 2006).

Ahnert, Gunnar, Lamb, and Barthel (2004) found the quality of care a child experiences is very important as the transition to a new child care arrangement is often a stressful event in a young child's life. Their research in Berlin found that the transition to child care was a stressful event for toddlers, and that these children experienced higher cortisol levels in the child care facility than they did at home during the transition, even while their mothers were present.

A 2008 study looked at the relationship between positive caregiving and child temperament on the attachment children develop in child care (De Schipper, Tavecchio, & Van

IJzendoorn). Their findings indicated that a higher frequency of positive caregiving practices was related to more secure child-caregiver attachment relationships. The frequency of positive interactions could play an especially important role in children gaining confidence in caregivers as a secure base. The researchers also postulated that a caregiver's sensitive interactions may not be enough for children to develop this confidence in their caregiver who must divide his or her attention among multiple children. They concluded that it is important that caregivers provide these positive interactions in a high enough frequency with individual children to promote a secure relationship.

A study conducted in the 1990s examined the relationship between the time a child spent with a "high ability" teacher and the attachment that the child developed (Raikes, 1993). The study included children from one child care center who attended full time, at least 25 hours per week, and had been with a teacher for at least 5 months. Ranging in age from 10 months to 38 months, the children in this study were placed with teachers as infants and remained with the same teacher until approximately age 3. The study consisted of 10 teachers who were considered "high ability" which meant that they scored above a 44 on the Early Childhood Teacher Perceiver (ECTP) upon being hired. The researcher found that 50% of children who had been with the same teacher for 5-8 months were securely attached; 67% of the children who had been with the same teacher for 9-12 months were securely attached; and 91% of the children who had been with the same teacher for over a year were securely attached.

Facial Recognition

A 2006 meta-analysis examined children's attachments to nonparental caregivers using studies that were conducted over a 25 year period (Ahnert, Piquart, & Lamb, 2006). The

researchers found that secure attachments to child care providers were more common in home-care arrangements than in child care centers. However, this analysis also found that secure attachments to nonparental caregivers as well as the similarity between the child-mother and child-caregiver attachments were more common in the earlier studies.

One important aspect that allows for the development of attachment is facial recognition. It is plausible to assume that an element of developing attachment to a caregiver requires the ability to recognize them. Researchers are uncertain whether or not the ability to recognize faces is innate, or if it develops through exposure to faces (de Haan & Nelson, 1999). This ability makes it possible for infants to determine which caregiver is providing the type of care that they need. Research indicates that infants typically develop a face “schema” around 4 months of age (Nelson, 2001). Faces constitute a special type of stimuli, and by 7- months-old, infants can classify faces according to gender (Nelson, 2001). Nelson also showed that infants between 4 and 9 months typically favor the right hemisphere of the brain when processing faces, which is similar to adults. Two potential reasons for this are that the right hemisphere develops faster than the left hemisphere, and that it is better at processing configural information (Nelson, 2001).

According to Maurer, Le Grand, and Mondloch (2002), three forms of configural processing exist: sensitivity to first-order relations, holistic processing, and sensitivity to second-order relations. Sensitivity to first order relations involves the ability of humans to detect face-like stimuli as faces share an overall configuration: a nose above a mouth, and two eyes above the nose. Holistic processing occurs when humans combine an individual’s specific facial features into a gestalt, or a unified whole. Finally, sensitivity to second order relations involves the ability of humans to detect the subtle variations in the shape and spacing of an individual’s

facial features. A 2007 study conducted by Schwarzer, Zauner, and Jovanovic sought to discover whether infants' process faces featurally or configurally. For their experiment, the researchers began by presenting two different faces to 4-, 6-, and 10-month- old infants. Then they presented the participants with two additional sets of faces that combined the facial features of the previous faces in order to determine if the children were processing individual facial features or faces as a whole. The two sets of test faces involved switched eyes and switched mouths. Schwarzer et al. found no evidence of holistic processing among the 4 month old participants, and therefore determined that 4-month-olds must process eyes and mouth as features that are independent of the face as a whole. However, they did find that 10-month-old infants processed both the eyes and mouth holistically, and 6-month-old infants processed the mouth holistically. Interestingly, they found that 6-month-old infants appear to process the eyes as an independent feature. The ability of infants to discriminate specific facial features could be involved in the development of attachment to familiar caregivers.

One popular method for examining recognition in infants is visual paired-comparison (VPC). This method consists of presenting the infant with a stimulus for a short amount of time in order to develop familiarization (Pascalis, de Haan, Nelson, & de Schonen, 1998). The infant was then presented with both a familiar and novel stimulus, and recognition of the familiar stimulus was determined by looking at the novel stimulus for a significantly longer amount of time. The 1998 study used VPC during three experiments in order to examine recognition (Pascalis et al., 1998). The researchers found the presence of long-term recognition memory after both a 2 minute and 24 hour retention interval in 3-month-old infants. These researchers were the first to discover “an electrophysiological correlate of recognition after a retention delay of 2 min”

in 3-month-old infants (p. 259). They also found that 3 and 6 month olds were able learn a face seen in various poses, and then recognize it in a different pose after a 2 minute or 24 hour interval. However, this did not occur in 3-month-old girls. The researchers determined in one of the three experiments that this was due to a lack of visual preference in the first experiment, and not a result of their memory capabilities.

A 1997 study examined ERPs for 6-month-old infants when they were presented with images of the mother's face and the image of either a similar or dissimilar looking stranger in separate experiments (de Haan & Nelson). In each of these experiments, 22 infants were presented with 22 pairs of images: an image of the child's mother and an image of a stranger. All of the images of the adults were taken from the neck up in front of a gray background, and each adult was photographed with a neutral expression. They conducted multiple experiments to test infants' ability to distinguish the mother's face from a similar looking stranger, and a dissimilar looking stranger. They found infants were able to distinguish the mother's face from both similar and dissimilar looking strangers when the faces were presented in equal probability.

In 1999, an experiment was conducted to examine "the characteristics of the developing cortical visual recognition system by comparing electrocortical activity during face versus object recognition by infants" (de Haan & Nelson, p. 1113). At the time their study was conducted, the current models suggested that a newborn's facial recognition abilities were mediated by a subcortical system. For their study, de Haan and Nelson used event-related potentials to examine the brain's electrical activity during a brief presentation of a face. During the study, the researchers exposed 6-month-old infants to both familiar and unfamiliar toys, as well as images of faces. They found that brain activity in a 6- month old infant differed when presented with

two-dimensional new stimuli and familiar stimuli. This suggested that infants of this age are capable of recognizing familiar objects. Such recognition would indicate that they can recognize a familiar face, as deHann and Nelson had found in their earlier study (1997).

While it is still unclear to what extent face recognition plays a part in attachment, there does seem to be a connection. If infants were unable to recognize familiar faces, it would likely be more difficult for them to develop an attachment to their caregivers. Infants have, to some extent, featural and configural face processing abilities (Schwarzer et al., 2007) which lends to the idea that they also possess abilities that allow them to recognize either individual features of familiar caregivers or the face of the caregiver as a whole. Although more work needs to be done, it is plausible to assume that facial recognition could possibly play a significant role in the development of infant attachment to their caregivers. If this is the case, caregivers can make more of an effort to increase face-to-face interaction with children in order to facilitate the development of the child's attachment to them.

III: Methodology

This study utilized a quasi-experimental design, based on phenomenology, incorporating an ethnographic technique in compliance with University Arkansas Institutional Review Board (IRB) regulations (14-03-569). Field observation was the primary method used in this study. Children ages 6 months to 2 years of age who attend the Jean Tyson Child Development Study Center were used in the research. Participants came from four classrooms: two infant classrooms and two toddler classrooms. Teachers of infants and toddlers in these four classrooms handed each parent a researcher-designed questionnaire to determine perceptions of their children's attachment styles. The questionnaires were given out to the parents 2 weeks before the

experiment began, and they were asked to return it within 1 week of receiving it. The teachers in each of these four rooms were also given a questionnaire to determine which children had developed an attachment to a specific caregiver. The primary goal of the questionnaires was to aid the researcher in selecting children to participate in the experiment who were currently exhibiting clear signs of attachment to their caregivers.

The experimental aspect of this study consisted of 5 sessions. Each participant experienced all five, 1-minute sessions on the same day, as well as in the same order. Each child only participated in the experiment one time. All sessions were both visually and aurally recorded using two Vaddio ClearVIEW HD-19 robotic cameras during the experiment.

A researcher- modified version of the Strange Situation (Ainsworth & Bell, 1970) was used to measure participant attachment behaviors to a familiar caregiver, one who looked similar to that caregiver, and one who looked somewhat different than the caregiver. Instead of Ainsworth's eight episodes, this study only used five. For the first session of the experiment, children remained in their familiar classroom setting for several minutes with one caregiver to whom they were determined to be attached. An adult remained out of sight of the study child in the classroom during the duration of the experiment for ratio purposes. During the second session, the caregiver either left the classroom or moved out of sight, and an adult who looked similar to the attachment figure entered the room. This "similar looking" person had the same hair color, body build, and face shape as the caregiver. The children were recorded to later examine their reaction to the new adult. This person remained in the room for no more than 2 minutes unless the child became very distressed, in which case they left sooner. In the third session, the caregiver to whom the children were attached came back into the room and the

similar looking stranger left. Once again, the caregiver remained in the classroom with the participant for several minutes. However, they remained in the classroom longer if the participant was still distressed. For the fourth session an unknown adult who looked very dissimilar from the previous adult and from the teacher came into the room for approximately 1 minute. This stranger session was cut short if the child became too distressed. Finally, the caregiver once again came back into the room, and the stranger left for the fifth session.

Three of the original Strange Situation episodes were excluded from this study. In Ainsworth's (1970) first episode, the mother and child were introduced to the experimental room by the observer, but as the children participated in the experiment in their own classroom this was unnecessary. The original third episode consisted of the mother, the baby, and the stranger. This was excluded due to the fact that it would have required an extra session in order to use both of the strangers. Finally, the original sixth episode in which the baby was left alone in the room was excluded due to the fact that this would most likely cause distress in the child, it would not comply with ratio regulations, and it would not be related to the research questions.

The first recording for the current study took place on May 9th, 2014, in one infant and one toddler classroom. The infant room provided 4 participants, and the toddler classroom provided 3 participants. The second recording took place on June 24th, 2014 in another single infant and another toddler classroom. One infant room provided 4 participants, and each of the other rooms provided 3 participants each.

Sampling

This study used convenience sampling. Parents who had voluntarily signed and returned consent forms in compliance with University of Arkansas IRB were sent a questionnaire about

their children's attachment behaviors (Appendix). Participants were the children of those parents who voluntarily signed consent forms and whose answers to the questionnaire indicated some likelihood of attachment behavior exhibited by their children. The focus of this study was to collect data for the purpose of richness of information, not to gather large numbers for generalizability.

Participants

The study contained 13 participants for the video portion of the research and 3 additional children were used in the questionnaire data. The subjects ranged in age from 11 months to 34 months of age. A total of 7 subjects ranging in age from 12 months to 21 months from infant classrooms participated in video recordings. The video from the toddler classrooms consisted of 6 toddlers who ranged in age from 24 months to 34 months of age. Separate questionnaires were given to 9 teachers and 32 parents.

Instrumentation

One instrument used for this study was questionnaires. The first was a parent questionnaire, designed to gather information on the child's attachment to primary caregivers, who were most likely family members (Appendix). The goal of the questionnaire was to determine whether the child demonstrated attachment behaviors outside of the child care setting from the perspective of the parent. The parent questionnaires contained 9 items. Parents were asked to list their child's birthdate and gender, answer questions about specific attachment behaviors, and to list which teacher, if any, to whom they thought their child had become attached. Secondly, a teacher questionnaire was used to determine the teachers' perception of which children had developed an attachment to a specific caregiver. Teacher questionnaires

contained 5 items, including the name and birthdate of children they perceived to be attached to them, as well as questions about specific attachment behaviors these children displayed. Children were chosen for the experiment based on both parental and teacher responses. Reliability of the questionnaires was addressed with the use of beta testers. The questionnaires were first sent to a statistician, who then passed them on to colleagues for feedback.

A researcher modified version of the Strange Situation, developed by Mary Ainsworth, was used to measure participant attachment. Instead of Ainsworth's eight episodes, this study only used five. These five sessions were: infant/toddler and caregiver, infant/toddler and similar looking adult, infant/toddler and caregiver, infant/toddler and unfamiliar stranger, and infant/toddler and caregiver. Familiar and unfamiliar strangers were chosen for this study based on Bowlby's (1969) belief that children have an innate bias to approach the familiar, as well as an innate bias to orient towards stimuli produced by known caregivers. Because certain behaviors, as well as the intensity of those behaviors, are signs of attachment in young children (Bowlby, 1969), the researcher observed children reported to be attached to their teacher for the occurrence of these behaviors. Final selection of participants was based on this observation data coupled with a signed parental consent form. Participants in the study were recorded in their own classrooms using video cameras. Many of the same behavioral responses, such as crying and smiling, were examined.

Another instrument used in this study was a researcher-created code book. The code book was created for the purpose of turning the collected data into material that could be analyzed using SPSS. Each child was assigned a different number for the purpose of coding in order to

protect their identity. The categories of affect, child bids, and response to bids were divided into sub-categories and given a number for coding.

Data Collection

Data was collected in three ways. The parents of children at the Jean Tyson Child Development Study Center were given a questionnaire about their child's attachment at the beginning of the study (See Appendix). This questionnaire was given to the teachers in each of the four infant and toddler classrooms, and they were asked to give it to the parents. The teachers in each of the four rooms also received a questionnaire. They were asked to rate the level of attachment they experience with the children in their classroom. Envelopes were provided with each questionnaire so that they could be returned confidentially. Parents returned questionnaires for 16 children who ranged in age from 11 to 34 months with a mean age of 22.75. Of the 16 children, approximately 43.8% were males and 56.3% were females. However, 2 of these children were not used due to their lack of displayed attachment behaviors, and 2 other children were not present on the day of the experiment.

The teachers in each of the four rooms also received a questionnaire. They were asked to rate the level of attachment they experienced with the children in their classroom (See Appendix). All 9 of the teachers who received questionnaires returned them, while only 16 of the 32 parents returned questionnaires.

The majority of the data came from video recordings. Children were recorded according to the classroom they were in, and recording took place on two different days. The 13 children who participated in the experiment consisted of 6 boys and 7 girls; 7 of these children came from the infant classrooms and 6 were from the toddler classrooms. The 6 toddlers and one infant

were all female. The researcher watched the recorded material three times: once to code for affect, once to code for child bids, and once to code for child response to adult bids.

Affect was coded according to 5 categories: happy, neutral, sad, anxious, anger/frustration. Four types of child bids were coded: negative (crying), neutral/positive (offers object, vocalizations), physical bid (coughing, sneezing), and no bid. Child responsiveness to adult bids was coded according to 4 categories: highly responsive (responded to most bids), responsive (responded to no more than half of bids), unresponsive (responded to no more than one bid), and highly unresponsive (responded to no bids). All 3 of the scales were developed and modified from the work of Ainsworth, Blehar, Waters & Wall (1978) and Kochanska (1997).

These codes were patterned after those used by Ainsworth and colleagues who used some specific behaviors in their measurement of the Strange Situation which included crying, smiling, and vocalization (1978). Kochanska's coding of mother and child interactions included child bids for the mother's attention, as well as the mother's response to the child (1997). This study did not include caregiver response as some of the strangers used in the experiment had been specifically informed that they did not need to entertain the children, which resulted in varied adult interactions across sessions.

The data from the parent and teacher questionnaires was coded in Excel and partially analyzed using SPSS. The parent questionnaires were coded according to the following responses: Yes- All the time and Yes- Sometimes were coded with a 1, while No and I don't know were coded with a 0. The teacher questionnaires were coded based on whether or not a particular teacher included a specific child from their classroom in their response. If they did

include a child in their response, it was coded with 1; if they did not include a particular child it was given a 0.

IV: Results

The data collected from the recorded material and the questionnaires was coded using Microsoft Excel and analyzed using Statistical Package for the Social Sciences (SPSS).

Analysis of Affect

A paired t-test was run to determine if child reactions during the sessions of the experiment that featured strangers differed. Child affect during Session 2, featuring the similar looking stranger, and Session 4, featuring the different looking stranger, were compared. The difference of child affect between Session 2 ($M = 4.15$, $SD = .55$) and Session 4 ($M = 4.08$, $SD = .94$) was not statistically significant ($M = .07$, $SD = .27$), $t(12) = 1.00$, $p > .05$. A paired t test was also run for Sessions 1 and 2, and 1 and 4 for affect. For Session 1, children were in their classroom with their designated caregiver. The t test determined that there was significance between both Sessions 1 and 2 and Sessions 1 and 4. The results are displayed in Table 2. Affect was coded on a scale with 5 for happy and 1 for anger/frustration. Most children were coded as happy or neutral during Sessions 2 and 4. However, children were coded as much happier in Session 1 than they were in Sessions 2 and 4. Some of the typical behaviors that were witnessed include smiling, eye contact, body turned toward adult, and neutral facial expression. Sessions 3 and 5 were not included in the data due to the fact that they were primarily only in place for the benefit of the children.

Analysis of Child Bids

Paired t tests were run to compare children's bids to adults during Sessions 2 and 4, 1 and 2, and 1 and 4. The paired t-test for child bids determined that the difference in number of child bids between Session 2 ($M = 2.31, SD = 1.10$) and Session 4 ($M = 1.77, SD = 1.09$) was statistically significant ($M = .53, SD = .87$), $t(12) = 2.21, p < .05$. The additional t test concluded that both the difference between Sessions 1 and 2, as well Sessions 1 and 4, were significant. See Table 2 for results. Child bids were coded on a scale with 4 being negative and 1 being the lack of any bids. Children in Sessions 2 and 4 exhibited mostly either positive/neutral bids or made no bid attempt at all. Children exhibited more positive/neutral bids during Session 2, with the similar looking adult, than during Session 4, with the dissimilar looking adult. Every child displayed positive or neutral bids during Session 1, which occurred with their teacher. The most frequent behaviors that were present during these sessions were vocalizations and offering an object to the adult. Sessions 3 and 5 were not included in the data due to the fact that they were primarily only in place to possibly calm the children.

Analysis of Child Response

The paired t-test for child responsiveness to bids determined that the scores from Session 2 ($M = 2.00, SD = 1.00$) and Session 4 ($M = 2.00, SD = .81$) were not significant ($M = .00, SD = .81$), $t(12) = .00, p > .05$. The differences between Sessions 1 and 2 and Sessions 1 and 4 were both found to be significant. See Table 2 for full results. Child responsiveness was coded on a scale with 4 being highly responsive and 1 being highly unresponsive. Children were generally responsive during Session 2, but mostly unresponsive during Session 4. Children were most responsive during Session 1 while they were with their teacher. Sessions 3 and 5 were not

included in the data due to the fact that they were primarily only in place for the benefit of the children.

Table 1.
t test Results for Session 2 and Session 4

Pair	n	Mean	SD	t	df	p
S2Affect- S4Affect	13	.077	.277	1.000	12	.337
S2Bids-S4Bids	13	.538	.877	2.214	12	.047
S2Response- S4Response	13	.000	.816	.000	12	1.000

Table 2.
t test Results for Session 1 and Session 2 and Session 1 and Session 4

Pair	n	Mean	SD	t	df	p
S1Affect S2Affect	13	.692	.630	3.95	12	.002
S1Affect S4Affect	13	.769	.599	4.62	12	.001
S1Bids S2Bids	13	.692	1.109	2.250	12	.044
S1Bids S4Bids	13	1.231	1.092	4.064	12	.002
S1Response S2Response	13	1.000	1.225	2.944	12	.012
S1Response S4Response	13	1.000	1.000	3.606	12	.004

Analysis of Parent and Teacher Questionnaires

Cohen's Kappa was used to determine the agreement between parent and teacher responses. A weighted Kappa was used in four categories: does the child cry when the parent/caregiver leaves, does the child reach for the parent/caregiver when they are near, does the child follow the parent/caregiver when they leave, and does the child cling to or smile at the parent/caregiver when they return. According to Viera and Garret (2005), the level of agreement for the Kappa statistic is as follows: less than zero equals a less than chance agreement; 0.01- 0.20 equals a slight agreement; 0.21- 0.40 equals a fair agreement; 0.41- 0.60 equals moderate agreement; 0.61- 0.80 equals a substantial agreement; and 0.81- 0.99 equals an almost perfect agreement. A fair agreement was found for three of the four categories: crying, following, and reaching. The test found a moderate agreement for the cling/smile category.

Table 3.

Agreement of Attachment Behaviors Between Parents and Teachers

Group	Kappa	Std error	Sig
Crying	.227	.116	.063
Following	.287	.128	.029
Reaching	.326	.099	.004
Cling/smile	.572	.103	.000

V. Discussion

The purpose of this research was to determine whether or not children displayed varying levels of behavior when presented with a stranger who had similar attributes to a caregiver and a stranger who had dissimilar attributes. The affect of children only varied slightly between Sessions 2 and 4, but was considerably higher during Session 1. Children primarily displayed neutral behaviors towards both of the strangers who participated in each of the experiments, but displayed primarily happy behaviors with the teacher. It was anticipated that children would behave more negatively toward the individual who looked dissimilar to the caregiver. This could mean that many children might not experience the so-called “stranger-danger” we are used to hearing about. However, the fact that the children were in a familiar and safe environment could have had an effect on how they responded to these individuals. The experiment might have produced different results had it been conducted in a new environment.

Children displayed more bids with the similar-looking individual than they did with the individual who looked dissimilar, with the most bids occurring with the teacher. This suggests that children were more comfortable with the individual who looked similar to the caregiver. It is possible that some children might not have realized that this individual was not their caregiver. However, it is also possible that they did realize the individual was a stranger but thought a similar-looking individual would be more likely to respond to their bids. Research has shown that infants as young as six months have the ability to distinguish specific facial features (Schwarzer, Zauner, and Jovanovic, 2007). Some of the individuals and caregivers who participated in the study did possess some similar facial features, which likely explains why the children interacted with these individuals more than the ones who did not have similar features. The acceptance behaviors displayed by children toward the similar looking individual could potentially explain why many children do sometimes become attached to a new individual very quickly. Perhaps the individual either looks like, or at least reminds the child of a familiar person.

Children responded to more bids from the individual who looked similar than they did with the dissimilar-looking individual. As previously discussed, this suggests that children either thought the similar-looking individual was their caregiver, or that they were at least more comfortable with that individual. Children primarily ignored the individual who looked different. This finding suggests that the children knew the stranger was not their caregiver. By ignoring this individual children demonstrated a preference for an individual who had familiar attributes.

The fact that children appeared to be more comfortable with individuals who possessed familiar characteristic suggests that children might be more likely to not only become more

attached to these individuals, but might also become attached more quickly. Considering the transition to child care is often very stressful, having a familiar individual around might make the transition to a new place much easier for children (Ahnert, Gunnar, Lamb, & Barthel, 2004). While it will be impossible in many cases, child care administrative staff should make an effort to place children with caregivers who possess familiar characteristics. The separation anxiety that most children experience during their transition to care (Ahnert, Gunnar, Lamb & Barthel, 2004) could potentially be lessened when placed with a caregiver who not only possesses familiar attributes, but is also attentive to their needs (Hirsh-Pasek & Golinkoff, 2003).

Regardless of whether or not a child can be placed with a caregiver who has familiar features, caregivers should attempt to make face-to-face interaction with children as often as possible, in addition to responding to a child's needs as sensitively and consistently as possible. Children are often carried facing out or on the caregiver's shoulder, which makes it fairly impossible for them to look at the face of their caregiver. A child cannot possibly visually recognize a caregiver if the child rarely sees the caregiver's face. In order to develop attachment to an individual, a child must be able to identify who is caring for them, and research has shown that infants most likely begin to recognize faces between 3 and 6 months of age (Nelson, 2001; de Haan & Nelson, 1999; Pascalis et al., 1998). While face-to-face interactions are central to recognition, the quality of these experiences is just as important. Not only is the sensitivity of a caregiver's interactions a significant part of the equation, but a high frequency of these interactions is also vital (De Schipper, Tavecchio, & Van IJzendoorn, 2008). Children must experience a high incidence of positive caregiving in order eventually rely on, and become attached to a caregiver (De Schipper, Tavecchio, & Van IJzendoorn, 2008). Another key factor

for the occurrence of these experiences is time spent with a qualified teacher. Raikes (1993) found that the majority of children who had been with a “high ability” teacher for at least 9 months were securely attached.

Meeting a child’s needs is obviously a vital aspect of the equation, but it only goes so far if a child is always unsure of who is caring for them. It is imperative that caregivers make an effort to make eye contact with children, even from a young age, while providing care for them.

The relatively low agreement between teacher and parent questionnaire responses is not surprising. Children might behave differently with parents and caregivers for several reasons. First of all, children likely experience different home and school environments. While teachers often have to walk away from one child in order to help another one, this may not be the case for children at home. Some children probably experience primarily one-on-one care at home. This difference of experience could also lead to children developing different attachment styles between parent(s) and teacher(s). If children have different experiences with parents and teachers it could lead to one of these attachments being more secure than the other, which would also lead to different behaviors exhibited by children.

Limitations

Many limitations were encountered during the course of this research. First of all, very few subjects participated in the study. The JTCDS had 32 infants and toddlers who were eligible to participate in the study, consent was obtained for 17 of those children, but only 13 were used in the experiment. Two of the toddlers were out of town on the day of the experiment, and the other 2 children were excluded due to their lack of reported attachment behaviors. Both the parent and teacher questionnaires indicated that these children did not display the indicated

attachment behaviors. Each of these children was almost 3 at the time of the experiment which likely had an effect on their displayed attachment behaviors. The study might have produced more significant results if more children had participated in the study. On a similar note, not all of the children who participated in the study were represented by a parent and/or teacher questionnaire. Had there been more children who participated in the study, along with both a teacher and parent questionnaire, the researcher could have examined the differences between parent perceptions of their child's attachment, teacher perceptions of the child's attachment, and the actual attachment behaviors displayed during the experiment. In addition, this study was conducted in a university lab school. The children who attend this facility are exposed to a much larger number of adults than children in a typical child care center. The fact that these children were more accustomed to new people entering their environment could have played a role in how they reacted to being directly presented with new people.

Another significant limitation experienced during the study was the lack of appropriate strangers. Some of the adult participants were not matched up as well as anticipated. The researcher used friends and acquaintances of those involved in the research for matches which limited the available choices. Not only did some of the adults not look as similar to the caregiver as anticipated, but some of the participants also did not look as dissimilar as planned. If this experiment were to be repeated, it would make sense to choose these matches from a wider pool of possible participants. In addition, the researcher did not consider having all adult participants wear similar clothing prior to the beginning of the experiment. It is possible that had these individuals been dressed similarly it might have affected the children's reactions to them.

The researcher also experienced some significant issues with the experiment itself. Due to researcher error, the third sessions was accidentally omitted from the experiment for three children in one infant room. The lack of this middle session in which the caregiver was to return could have had an effect on the displayed behaviors present in Session 4 for each of these children. Also, several factors contributed to the inconsistency of experiment sessions. Some sessions lasted longer than anticipated for several reasons: waiting for any kind of response from the child, an adult participant not in place to switch on time, and distractions in the hallway that could have disrupted the experiment. Similarly, some sessions did not last as long as anticipated for the following reasons: a child becoming upset, an adult participant entering the room ahead of time, and needing to rush through the sessions in order to avoid disrupting the schedule of the child and their classmates. Another issue that occurred was the children being too engaged in the toys or activity that was presented to pay much attention to the strangers who came into the room. Different toys and activities were chosen based on the ages and interests of the children in a particular room. Several of the children who participated were so engaged with a new toy or activity that they hardly acknowledged the strangers. It is possible that this had an effect on the children's behavior as they might have behaved differently had they not been so engaged with something else.

Finally, after the parent questionnaires had been handed out, the researcher was informed that a few of the parents were confused about their questionnaire. Despite the fact that questions specifically referred to the parent, some parents were reportedly unsure if the questions were referring to how the child acts at home with parents, or with the teachers at the center. This

confusion among some parents, whether caused by the questionnaire or parent haste, likely led to inaccurate responses.

VI. References

- Ahnert, L., Gunnar, M. R., Lamb, M. E., & Barthel, M. (2004). Transition to child care: Associations with infant–mother attachment, infant negative emotion, and cortisol elevations. *Child development, 75*(3), 639-650.
- Ahnert, L., Pinquart, M., & Lamb, M. E. (2006). Security of children's relationships with nonparental care providers: A meta-analysis. *Child Development, 77*(3), 664-679.
- Ainsworth, M. D. S. (1967). *Infancy in Uganda: Infant care and the growth of love*. Baltimore: Johns Hopkins Press.
- Ainsworth, M. D. S., & Bell, S. (1970). Attachment, exploration, and separation: Illustrated by the behavior of one-year-olds in a strange situation. *Child Development, 41*(1), 49-67.
- Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the strange situation*. Hillsdale, New Jersey: Lawrence Erlbaum Associates, Inc.
- American Academy of Pediatrics. (2013). *Choosing a child care center*.
- Arkansas Department of Human Services Division of Child Care and Early Childhood Education Licensing and Accreditation Unit. (2014). *Minimum licensing requirements for child care centers* (PUB-002 (REV. 08/05/2014)). Little Rock, AR.
- Belsky, J. *Early day care and infant-mother attachment security*. Encyclopedia on Early Childhood Development. (2009).
- Belsky, J., Vandell, D. L., Burchinal, M., Clarke-Stewart, K. A., McCartney, K., & Owen, M. T. (2007). Are There Long-Term Effects of Early Child Care? *Child development, 78*(2), 681-701.
- Bowlby, J. (1969). *Attachment and loss. vol. 1: attachment*. New York: Basic Books.
- Bowlby, J. (1979). *The making and breaking of affectional bonds*. London: Tavistock Publications Limited.
- Cassidy, J., & Shaver, P. R. (2008). *Handbook of attachment: theory, research, and clinical applications*. New York: Guilford Press.
- Child Outcomes When Child Care Center Classes Meet Recommended Standards for Quality. (1999). *American Journal of Public Health, 89*(7), 1072-1077.

- Colin, V. (1996). *Human attachment*. New York: McGraw-Hill.
- DeBord, K. (n.d.). *Quality child care: what does it really mean?*. Retrieved from <http://www.ces.ncsu.edu/depts/fcs/pdfs/fcs460.pdf>.
- de Haan, M., & Nelson, C. A. (1997). Recognition of the mother's face by six-month-old infants: A neurobehavioral study. *Child Development, 68*(2), 187-210.
- Hale-Jinks, C., Knopf, H., & Knopf, H. (2006). Tackling teacher turnover in child care: Understanding causes and consequences, identifying solutions. *Childhood Education, 82*(4), 219-226.
- Harlow, H. F. & Zimmermann, R. R. (1958). The development of affective responsiveness in infant monkeys. *Proceedings of the American Philosophical Society, 102*, 501 -509.
- Helburn, S. W., & Howes, C. (1996). Child care cost and quality. *The future of children, 62-82*.
- Hirsh-Pasek, K., & Golinkoff, R. M. (2003). *Einstein never used flash cards: How our children really learn--and why they need to play more and memorize less*. Rodale.
- Kochanska, G. (1997). Mutually responsive orientation between mothers and their young children: Implications for early socialization. *Child Development, 68*(1), 94-112.
- Laughlin, L. (2013). Who's minding the kids? Child care arrangements: Spring 2011. *US Census Bureau*.
- Maurer, D., Grand, R. L., & Mondloch, C. J. (2002). The many faces of configural processing. *Trends in cognitive sciences, 6*(6), 255-260.
- National Association of the Education of Young Children (NAEYC). (2013). *Revised guidance for assessment effective October 1, 2013: naeyc early childhood program standards and accreditation criteria*.
- NICHD Early Child Care Research Network. (2006). The NICHD study of early child care and youth development (SECCYD): Findings for children up to age 4 ½ years.
- Nelson, C. A. (2001). The development and neural bases of face recognition. *Infant and Child Development, 10*(1-2).
- Pascalis, O., de Haan, M., Nelson, C., & de Schonen, S. (1998). Long-term recognition memory for faces assessed by visual paired comparison in 3- and 6-month-old infants. *Journal Of Experimental Psychology. Learning, Memory, And Cognition, 24*(1), 249-260.

- Peisner-Feinberg, E. S., Burchinal, M. R., Clifford, R. M., Yazejian, N., Culkin, M. L., Zelazo, J., Howes, C., Byler, P., Kagan, S.L., Rustici, J. (1999). The Children of the Cost, Quality, and Outcomes Study Go to School. Technical Report.
- Raikes, H. (1993). Relationship duration in infant care: Time with a high-ability teacher and infant-teacher attachment. *Early Childhood Research Quarterly*, 8(3), 309-325.
- Schwarzer, G., Zauner, N. and Jovanovic, B. (2007), Evidence of a shift from featural to configural face processing in infancy. *Developmental Science*, 10: 452–463.
- US Bureau of the Census. (2010). Who's minding the kids? Childcare arrangements: Spring 2005/summer 2006. Washington, DC: Government Printing Office.
- Viera, A. J., & Garrett, J. M. (2005). Understanding interobserver agreement: the kappa statistic. *Fam Med*, 37(5), 360-363.

VII. Appendices

Appendix A: IRB Approval

April 17, 2014

MEMORANDUM

TO: Jessica Hamilton
Mardel Crandall

FROM: Ro Windwalker
IRB Coordinator

RE: New Protocol Approval

IRB Protocol #: 14-03-569

Protocol Title: *A Comparison of Infant and Toddler Reactions to Strangers who have Similar Attributes to an Established Attachment Figure vs. Strangers who have Different Attributes*

Review Type: EXEMPT EXPEDITED FULL IRB

Approved Project Period: Start Date: 04/15/2014 Expiration Date: 04/14/2015

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. This form is available from the IRB Coordinator or on the Research Compliance website (<http://vpred.uark.edu/210.php>). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

This protocol has been approved for 44 participants. If you wish to make *any* modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

If you have questions or need any assistance from the IRB, please contact me at 210 Administration Building, 5-2208, or irb@uark.edu.

Appendix B: Parent Questionnaire

Dear JTCDSO parents,

My name is Jessica Hamilton, and I am in my final semester of the Human Development and Family Sciences Master's program. I will soon begin collecting data for my thesis on child-caregiver attachments, and I am asking for your help. I need parents to respond to this short questionnaire to help assess each child's developmental level of attachment. Based on this questionnaire, teacher feedback, and observations, I want to select children who are actively showing signs of attachment for further study. For my study I will compare the reactions of the selected children when new people enter the room. One new person will be physically matched to current caregivers at the center, and another will have physical attributes that look vastly different from those of the caregiver. These individuals will enter the room and approach the child but they will not come into direct contact with them. Another familiar caregiver will remain in the room at all times. The risks involved in this study are minimal as outlined in IRB #14-03-569. If a child becomes distressed at any point, we will stop. If you have any questions you can contact me at [REDACTED], or my thesis chair Mardi Crandall at [REDACTED]. Please seal this in the envelope provided and return it to your child's teacher or to Erin in the front office by 5/1/14. Return of a completed questionnaire constitutes consent.

You may also contact the University of Arkansas Research Compliance office listed below if you have questions about your rights as a participant, or to discuss any concerns about, or problems with the research.

Ro Windwalker, CIP

Institutional Review Board Coordinator

479-575-2208

irb@uark.edu

1. Please list the birthdate and gender of your child:

Birthdate: _____ Male or female? _____

2. It is common for young children to cry when their parent leaves the room. Does your child currently display this behavior when you leave the room?

Yes- All the time Yes- Sometimes No I don't know

3. Young children also commonly attempt to follow the parent when their parent leaves the room. Does your child currently attempt to follow you when you leave the room?

Yes- All the time Yes- Sometimes No NA (too young)

4. When reunited with the parent, young children often respond by smiling at the parent or by clinging to them. Does your child currently cling to you or smile at you when you return?
 Yes-All the time Yes- Sometimes No NA (too young)
5. Young children display various reactions when they encounter strangers. How does your baby respond when left with a stranger?
6. It is also common for young children to reach their arms toward their parent when the parent is near. Does your child reach their arms toward you when you are near them?
 Yes-All the time Yes-Sometimes No
7. Finally, it is also very common for young children to be in a phase of attachment where they do not display any of the aforementioned behaviors. These children often display goal-corrected behaviors such as showing an object to you or just briefly checking in with you during play. Does your child currently display any of these goal-corrected behaviors?
 Yes- All the time Yes- Sometimes No I don't know
8. Sometimes children cry (or show behaviors as described above) when a caregiver leaves the room. Does your child cry when his or her caregiver at the center leaves the room?
 Yes- All the time Yes- Sometimes No I don't know
9. If you answered "Yes-All the time" or "Yes-Sometimes" to number 8 above, please give the name(s) of the caregiver(s) who you think would be most likely to elicit such responses in your child.

Appendix C: Parent Consent Form

A Comparison of Infant and Toddler Reactions to Strangers who have Similar Attributes to an Established Attachment Figure vs. Strangers who have Different Attributes **Consent for a Minor to Participate in a Research Study**

Principal Researcher: Jessica Hamilton

Faculty Advisor: Mardel Crandall

This is a parental permission form for research participation. It contains important information about this research study and what to expect if you permit your child to participate.

Your child's participation is voluntary.

Please consider the information carefully. Feel free to discuss the study with your friends and family and to ask questions before making your decision whether or not to permit your child to participate. If you permit your child to participate, you will be asked to sign this form and will receive a copy of the form.

INVITATION TO PARTICIPATE

Your child is being invited to participate in a research study about child-caregiver attachments. Your child is being asked to participate in this study because he or she is the age at which children demonstrate attachments and parent and teacher feedback to questionnaires has indicated he or she demonstrates age-appropriate attachments.

WHAT YOU SHOULD KNOW ABOUT THE RESEARCH STUDY

Who is the Principal Researcher?

Jessica Hamilton [REDACTED]

Who is the Faculty Advisor?

Mardel Crandall [REDACTED]

What is the purpose of this research study?

The purpose of this study is to examine the association between the presence of child attachment and recognition of the caregiver, focusing on physical characteristics.

Who will participate in this study?

The participants of this study will include infants and toddlers from the JTCDSC, as well as their parents and teachers.

What will your child be asked to do?

Your child's participation will require the following:

Children will remain in their classrooms during this project. The caregiver they have displayed an attachment for will leave the room, and an adult who looks similar to the caregiver will enter. This individual will walk toward your child and speak to them, but they will not touch your

child. That individual will leave the room after no more than a minute and the caregiver will come back. The caregiver will remain in the room as long as necessary. They will then leave the room and a new individual, who looks very dissimilar from the caregiver, will enter the room and will walk toward and speak to the child, but will not touch them. This individual will leave after no more than a minute and the caregiver will return. Video capture will record your child's reaction to the similar-looking stranger and the dissimilar stranger.

What are the possible risks or discomforts?

Because your child's wellbeing is of paramount importance to us, if they appear distressed at any point, the researcher will stop the experiment, and the caregiver will return. The audio/visual recording of this distress will still be used as data. It is possible that the presence of a stranger may be perceived by your child to be a stressor or a delight.

What are the possible benefits to your child if he/she participates in this study?

There are no perceived benefits nor harm to the children involved in this study.

How long will the study last?

Your child's participation will likely only last for about five minutes. It will only take more time if the child is upset and the caregiver needs to remain in the room with them for a longer period of time.

Will your child receive compensation for time and inconvenience if you choose to allow him/her to participate in this study?

No.

Will you or your child have to pay for anything?

No, there will be no cost associated with your participation.

What are the options if I do not want my child to be in the study?

If you do not want your child to be in this study, you may refuse to allow him/her to participate. Your child may refuse to participate even if you give permission. If your child's behavior indicated he or she does not feel comfortable participating in the experiment, the teacher will re-enter the scene and the stranger will leave. However, this reaction will still be considered part of our data on reaction. Your child will not be punished or discriminated against in any way if you refuse to allow participation or if your child chooses not to participate. They will not be affected in any way, and your relationship with the JTCDSO will not be affected in any way if you refuse to participate.

How will my child's confidentiality be protected?

All information will be kept confidential to the extent allowed by applicable State and Federal law and University policy. All information will be kept in a secure area for the duration of the project. Children's names will not be used in data collection; rather, all information will receive a code to protect children's identity. The child's name and birthdate will not be used to identify his/her participation in the collected data. When audio/visual data is recorded and coded, it will

be deleted from all video devices. Coded information will be kept according to Federal and State regulations on human subjects for a minimum of three years. Coded information will be kept in a locked cabinet at the Jean Tyson Child Development Study Center. Only my advisor and I will have access to the coded information.

Will my child and/or I know the results of the study?

At the conclusion of the study you will have the right to request feedback about the results. You may contact the faculty advisor, Mardel Crandall ([REDACTED]) or Principal Researcher, Jessica Hamilton [REDACTED]. You will receive a copy of this form for your files. This research will be submitted for peer reviewed publication, and you will be notified if it is published.

What do I do if I have questions about the research study?

You have the right to contact the Principal Researcher or Faculty Advisor as listed below for any concerns that you may have.

Jessica Hamilton [REDACTED]

Mardel Crandall [REDACTED]

You may also contact the University of Arkansas Research Compliance office listed below if you have questions about your rights as a participant, or to discuss any concerns about, or problems with the research.

Ro Windwalker, CIP
Institutional Review Board Coordinator
Research Compliance
University of Arkansas
210 Administration
Fayetteville, AR 72701-1201
479-575-2208
irb@uark.edu

I have read the above statement and have been able to ask questions and express concerns, which have been satisfactorily responded to by the investigator. I understand the purpose of the study as well as the potential benefits and risks that are involved. I understand that participation is voluntary. I understand that significant new findings developed during this research will be shared with me and, as appropriate, my child. I understand that no rights have been waived by signing the consent form. I have been given a copy of the consent form.

Parent/Guardian Signature

Date

Appendix D: Teacher Questionnaire

JTCDSO teachers,

I have enjoyed getting to know most of you over the past year and a half as we have worked side by side at the Jean Tyson Child Development Study Center. I am preparing to begin my thesis research and I would greatly appreciate your help. My research is about the relationship between child attachment to a caregiver and their recognition of that caregiver. Your responses will assist me in deciding which children should be included in the study. Please seal this in the envelope provided and return it to the front office no later than 5/1/14. Full details of this research can be found at IRB #14-03-569. Filling out and returning this questionnaire constitutes consent.

You may also contact the University of Arkansas Research Compliance office listed below if you have questions about your rights as a participant, or to discuss any concerns about, or problems with the research.

Ro Windwalker, CIP

Institutional Review Board Coordinator

479-575-2208

irb@uark.edu

- 1) Please list the first names and birth dates of the children in your care who seem to have developed an attachment to you:

- 2) Do any of the children in your room cry when you walk away from them or leave the room? If so, please list their first name(s):

- 3) Do any of the children in your room attempt to follow you when you walk away from them or leave the room? If so, please list their first name(s):

- 4) Do any of the children in your room cling to you or smile at you when you return? If so, please list their first name(s):

- 5) Do any of the children in your room reach their arms toward you when you are near? If so, please list their first name(s):